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AUTHOR Mehrabi, Shah M.
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ABSTRACT

The economic costs and benefits of educating foreign students in U.S. public and private colleges are estimated. U.S. costs of educating foreign students consist primarily of: (1) direct educational costs, (2) cost of the foreign students who receive their maintenance allowance from U.S. sources, (3) travel costs of those foreign students whose travel is financed from U.S. sources, and (4) other administrative costs related to special problems of foreign students. Two problems in estimating foreign student educational costs involve the marginal or the average cost, and adjusting for over-representation of foreign students in relatively expensive courses in science and graduate studies. To calculate the weighted average cost of a foreign student, it is necessary to determine the distribution of foreign students by field and level, and average cost by field and level. Economic benefits to the United States primarily come from tuition payments, unpaid research by graduate students, contributions to aggregate demand, and value of embodied capital in non-returnees. For these different areas, actual cost-benefit calculations are shown. Data were obtained from the National Longitudinal Study of Young Men 14-24 years old in 1966. (SW)

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Educating Foreign Students in The U.S.A.: A Cost Benefit Analysis

Prepared for

Annual Meetings of the Association for The Advancement of Science, Policy and Research in the Third World.

Shah M. Mehrabi

Mary Washington College

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HE 019 473

Educating Foreign Students in the U.S.A: A Cost Benefit Analysis

Introduction:

In the recent past the number of foreign students in the USA has been doubling every five or six years. According to a recent report published by the American Council on Education, the number of students in the USA may reach one million or so by 1990, and at the graduate level, they may represent more than 25 percent of the total graduate enrollment. [1] Other industrialized countries have also experienced a similar influx of foreign students. This accelerated international mobility of students, largely from Third World countries to the industrialized world, without much reciprocity, is being seen as a "problem". Concern is being voiced and restrictive rationing/pricing policies are being devised in most European countries to regulate this mobility.[2] Socialist countries, on the other hand, are aggressively recruiting foreign students from Third World countries. Among the leading host countries for foreign students, America is perhaps the only country which neither has nor is likely to have, a centralized policy to regulate their flow. The council's report seems to reflect the likely future course of action. While this report has not recommended a restrictive policy, it has advised that "those in higher education who are responsible for deciding institutional policy may benefit from an awareness of developments in other countries: the concerns voiced about large foreign student population and strategies employed in dealing with foreign students."[4]

There are several reasons why the U.S., despite predictions of the large nember of foreign students, has not shown its concern with the same strength as other major host countries have. First, although the number of foreign students in the U.S. is much larger than any other country, foreign students as a percentage of the total enrollment make up a little over 2%, while in most of the other host countries it ranges between 5% to 20%. This means that in the U.S.A. there is no significant "displacement effect", i.e., foreign students are not occupying home student's positions in schools. Second, in the U.S.A. the tuition fee is relatively higher than in most European countries; hence, subsidy is relatively low. Third, the projected declining enrollment of "traditional students" is expected to widen the gap between the marginal and average cost, and more non-traditional students can help to keep the gap low.

While there is a consensus about the increasing importance of international technical exchange and cultural understanding to sustain the necessary cooperation on global issues in an interdependent world, and the role of international students to promote these objectives, the recent trends to regulate their flow is based on purely economic grounds. The cultural, educational, and political costs and benefits are either not qualifiable or are in a different time span. Short-run costs may have been weighted more than long-run benefits. While economic considerations alone are not sufficient to make a case for or against, they are nevertheless important in such decisions. Scanning through the economic costs and benefit of educating foreign students may not only be helpful in guiding institutional policy towards foreign students, but may be helpful in developing an attitude towards students as to whether they are merely recipients of charity, objects of investment with some expected deferred returns, or purchasers of a service. Such studies do not exist

for the U.S., as the Council's report observed, and perhaps this is why it recommended benefiting from the recent policies of other countries.[5] This study is an attempt in this direction, namely, an estimation of the economic costs and economic benefits of educating foreign students in the U.S.A. In Section I, I have estimated the economic costs. Section II deals with the benefits of the U.S. In Section III, I have summarize the results and drawn some conclusions.

I: Economic Costs

U.S. Costs of educating foreign students consist primarily of (A) direct educational costs, (B) maintenance cost of the foreign students who receive their maintenance allowance from U.S. sources, (C) travel costs of those foreign students whose travel is financed from U.S. sources, and (D) other administrative costs related to special problems of foreign students.

(A) Direct Educational Costs: The direct educational cost of a home student and a foreign student, provided they are both in the same field and at the same level, are the same. There are, however, two problems which make the estimation of educational costs of foreign students difficult. (a) In the calculus of educational costs of foreign students, should one consider the marginal costs or the average cost and (b) how one should adjust for the over-representation of foreign students in relatively more expensive courses in hard-sciences and graduate studies.

a) Marginal vs. average costs: Foreign students represent only about 2% of the total enrollment and they are dispersed over more than 2,000 colleges around the country. Therefore they could be considered as marginal students. For the U.K., where foreign students represent about 11% of the total enrollment, Blaugh has argued for long run marginal cost and used it in his calculations.[6] I find it difficult to agree with him. Which cost concept is appropriate depends on the intent of the inquiry. If the question is how much of resources will be saved if we reduce foreign students or how much

will it cost if we increase them, marginal cost would be the appropriate concept. Or if the education technology were scale-fixed and unused capacity wasinevitably without foreign students, marginal cost might make sense.[7] But neither the education production technology is scale-fixed nor the purpose of the inquiry is to estimate the savings in costs of changing the number of foreign students. It rather is to estimate the total cost of educating all the foreign students in the U.S. I find it difficult to see why a foreign student, using the same facilities, costs only 2/3 the amount of a home student.[8] I consider short-run average cost as the most appropriate measure. The short-run average cost includes the educational and general expenditures (E & G) per student plus the user cost of capital which consists of the depreciation and the interest foregone on the land and buildings. Since appropriate data on depreciation are not available I have used the E & G per FTE as the average cost. This omission will result in an under-estimation of the actual costs.

b) Over-representation of foreign students in relatively more expensive fields of study: Because the majority of foreign students are either in hard-sciences or graduate programs, the weighted average cost of a foreign student is higher than for a home student. To calculate such a weighted average one needs (i) the distribution of foreign students by fields and by level, and (ii) the average cost by field and by level.

(i) The distribution of foreign students by field and by level: The distribution of foreign students by major fields of study and by institutional control is available in Open Doors, 1979/80.[9] Also available is the distribution by academic level. But a cross-classification by field and by level is not available. On the assumption that the distribution by academic level is the same in each major field of study, I estimated the distribution of foreign

students by level and by field.

(ii) Average cost by field and by level: The data on average cost by level and by field is not available either.[10] To get around the problem I have used the Ohio Board of Regent's weighting system for fiscal year 1980. This weighting system is based on the Regent's financial model for fiscal year 1980. This financial model classifies university students into twelve categories, ranging from General Studies I, which consists primarily of Freshmen and Sophomores in non-laboratory-intensive and least-expensive fields, to the Doctor II, including the most expensive graduate fields of study. The weights assigned to these catagories are based on historical educational and general (E&G) expenditures. I condensed the first two categories, General Studies I and II in one category and called it GSE. Taking this new category GSE as the basis, I recalculated the weights for other categories by first replacing the Ohio tuition fee with the national average undergraduate and graduate fee in public schools. The adjusted weights are given in Appendix Table I. Using these weights I converted all foreign students in four-year public schools in different fields of study into their GS equivalent numbers. All the foreign students in two-year public schools was treated as equivalent to GS students. On the assumption that the relative expenditures for different fields of study in private schools are the same as in public schools, I similarly estimated the total number of GS-equivalent foreign students in private schools. There were 286,340 foreign students in the U.S. in 1979/80. Converted

to the GS-equivalent level, they come to 571,418. (See Appendix Table 1).

E & G expenditure per FTE at the GSE level in public schols was obtained as follows:

E & G = b(ax + y) where

a = The ratio of the average government appropriations per FTE for the U.S. as a whole to the corresponding appropriations for Ohio.

b = The ratio of the U.S. State appropriations plus the undergraduate tuition fee per FTE in public schools to the E & G expenditure per FTE student.[11]

x = Ohio's average subsidy per FTE student at the GSE level.

y = Average undergraduate tuition in public schools.

The estimated E & G expenditure per FTE at the GS level in private schools is 1.482 times that of public schools.[12] The resulting E & G estimates are presented in Appendix Table 2. A weighted sum of these E & G expenditures, weights being the GS-equivalent number of foreign students, gives the total E & G cost of foreign students. This comes to 1590 million dollars.

(B) Maintenance Cost: Some foreign students receive not only tuition but their maintenance allowance from U.S. sources.

Numerous agencies are involved in international educational and cultural exchange programs. To get the detailed data on them is almost impossible. Therefore, I have used data from Open Doors, according to which there were 3027 foreign students supported by the U.S. Government; 2,875 by U.S. private sponsors, and another 13,919 by their schools.[13] School support, however, is usually in the form of fellowship/scholarships or research/teaching assistantships. Research/teaching assistants, although they use U.S. resources, pro-

vide service in return and therefore should be excluded from those calculations. How many of the 13,919 receive fellowship is not known. Assuming that the ratio of fellowship/assistantships is the same among foreign students as among home students, which is 0.4, the estimated number of foreign students on fellowships is 5568. This brings the total number of foreign students who receive their maintenance allowance from U.S. sources to 11,470. The average suggested maintenance cost for 1979/80 was $4104.[15] Hence, the total maintenance cost to the U.S. is 47.1 million dollars.

(C) Travel cost: Foreign students supported by U.S. government or U.S. private sponsors presumably get return tickets from U.S. sources. To estimate the travel cost to the U.S., I assumed that U.S. sponsored foreign students follow the same geographic pattern within world regions as all foreign students.[16] Furthermore I assumed that they get an economy fare from the capitols of the representative countries of the world regions to New York and back plus $200 to compensate for the expenses to get to the international airport from their home town and from port of entry to the final destination in the U.S. The total cost to the U.S. thus comes to 10.5 million dollars.[17]

(D) Other Administrative Costs: Generally institutions provide some special services to foreign students. Furthermore, there are added administrative cost specially related to foreign students. Institutions generally pass on major costs of these special services either by directly charging full-cost for the service or in the form of a special fee. Other costs are relatively insignificant. Additional support is provided by the U.S. International Communications Agency in terms of counceling and placement of foreign students through ICA Posts abroad and providing support to foreign student offices on U.S. campuses. In 1978, ICA spent 2.15 million dollars to provide these special services to foreign students.[18]

Economic Benefit to the U.S.: Economic benefits to the U.S. primarily come from (i) tuition payments, (ii) unpaid research by graduate students, (iii) contributions to aggregate demand, and (iv) non-returnees.

(i) Tuition Revenues: Foreign students pay out-of-state tuition in public schools. Estimates of tuition revenues are obtained separately for public and private schools. Calculations are shown in Table 3. The total tuition revenue from non-U.S. supported foreign students is 613.5 million dollars.

(ii) Value of Unpaid Research: Graduate foreign students engage in research while working on their dissertations and theses. This is unpaid research, part of which is useful to the U.S. Let us conservatively assume that 1/10 of the 1979/80 graduate foreign students engaged in this research in 1981/82 and for only one year. There is no obvious way to objectively measure the dollar value of this research. However, if the U.S. had to hire research assistants to do this research instead, what would have been the cost of this research?[19] If the 1981/82 average annual salary of a research assistant was $13,000, the value of this research comes to 122 million dollars, the 1979/80 discounted value of which is 97.6 million dollars.

(iii) Contribution to Aggregate Demand: The total number of non-U.S. supported foreign students less the number of foreign students employed in the U.S. multiplied by average maintenance cost is the net addition to the consumption expenditure by foreign students. This figure comes to 1096 million dollars. However, only a fraction of this consumption expenditure contributes to the net aggregate demand. If we assume the net valueadded as approximately 60% of the gross sales in consumer goods and services, which the foreign students generally patronize, the net contribution to the aggregrate demand comes to 657.6 million dollars. It may be argued that only part of this additional aggregate demand leads to additional employment and the balance is absorbed in increasing prices if the goods and services.

However, this demand is such a small fraction of the total aggregate demand and since foreign students are dispersed all around the country, that it amy plausibly be assumed that it does not affect the prices significantly.

(iv) Value of Embodied Capital in Non-Returnees: There have been several studies to qualify the benefits and costs associated with Brain Drain.[20] Most of these studies used the human capital approach developed by Harry Johonson.[22] Depending on the motive of measurement and the availability of data, different variations of the human capital approach have been applied. If the purpose is to evaluate the loss of the country of emigration, the production cost of the exported human capital in emigrating country's prices is used. If the purpose is to evaluate the gaon to thecountry of immigration, generally the counterfactual approach is employed, i.e., how much will it cost to produce the equivalent human capital domestically. Another version of the human capital approach is to calculate the present value of the expected future earnings of the immigrant human capital. In view of the purpose of our calculations and the availability of data, it seems appropriate to use the counterfactual model to estimate the cost-savings to the U.S. from the non-returning foreign students. These consist of child-rearing and educational costs. However, I did not include child-rearing costs because this would imply that a country would benefit by importing unskilled labor. I have included (a) the educational costs, and (b) the earnings foregone.

(a) Educational Costs: On the assumptions that the average age of a foreign student at the time of entrance is 20 years, that he has two years of college education, and that he studies in the U.S. for three years, the present value of the educational costs is given by

$$= \sum_{i=1965/66}^{1978/79} E_i(1 + r_1)^{1978/79 - i} + \sum_{i=1979/80}^{1981/82} E_i/(1 + r_2)^{1981/82 - i}$$

Where E_i represents the U.S. educational expenditures per student in the ith year at 1979/80 constant dollars at the corresponding education level, r_1 is the real rate of interest corrected for inflation and is obtained as the difference between average percent interest on Government one-year securities over 1965-78 and the average percent increase in consumer price index for the same period, and r_2 is the interest rate corrected for inflation for the period 1980-82.[23] The total U.S. educational cost to produce an American with skills equivalent to an average non-returnee in 1979/80 prices thus comes to $46,453.

(b) Earnings Foregone: The second component of our cost savings is the earnings foregone. On the assumption that earnings start after the age of 14 years, the present value of earnings foregone is given by

$$\sum_{i=1973/74}^{1978/79} I_i \,(1 + r_3)^{1978/79 - i} + \sum_{i=1978/79}^{1981/82} I_i/(1 + 2_4)^{1981/82 - i}$$

Where I_i is the earnings foregone in ith year in constant 1979/80 dollars and r_3 is the interest rate corrected for inflation as above. The data on mean earnings by age and education level is taken from current population reports.[24] The present value in 1979/80 of the total earnings foregone thus calculated comes to $98,881.

Hence the value of the embodied capital in a non-returnee which is the sum of the educational expenditures and the foregone earnings comes to $145,334.

Exact data on the number of non-returnees is not available. We have estimated it using the data published by Immigration and Naturalization Service. There are essentially two legal ways in which persons who enter the U.S. as students may not return. One, their status is adjusted while they are in the U.S., and two, they fulfill the required formalities here, return to their country for a very brief period of a few days or weeks to pick up their immigration papers there, and re-enter as immigrants, generally on occupation preference. The data on status adjustment of students is available. Also available

are the data on the total number of immigrants with occupational preference. But what fraction of immigrants on occupational preference are "return students" is not known. A conservative estimate of 20% is used in this study. The total number of non-returnees thus estimated comes to 28,138.[25] And hence the benefits from the non-returnees comes to the magnitude of 4080 million dollars.

Conclusion: The above cost-benefit calculations for all foreign students in higher education including both public and private schools, yield in following:

Total Costs (mill. dollars)	-1649.8
E & G expenditures	-1590.
Maintenance cost	-47.1
Travel cost	-10.5
Other costs	-2.2
Tuition Benefits (mill. dollars)	5448.7
Tuition revenue	613.5
Value of unpaid research	97.6
Contribution to aggregate demand	657.6
Value of embodied capital in non-returnees	4080.0
Net benefit over costs	3799.9

These calculations indicate a net benefit of the magnitude of 3780 million dollars. This result, however, depends largely on the benefits from the non-returnees. The interpretation of these results therefore depends on ones judgment as to (i) whether the benefits from the non-returnees should or should not be included in these calculations, (ii) if they are included, whether human-capital approach using U.S. data is justified in evaluating these benefits and (iii) the accuracyof the underlying assumptions in such an estimation.

(i) Whether one should or should not include the benefits from non-returnees depends on the following hypothetical question: If the potential non-returnees are not allowed to enter the U.S. as students, will they be able to enter as immigrants through alternative channels? The answer seems to be a qualified yes. They will still be able to enter but at a slower rate. Ane hence only a part of this "brain drain" should be

attributed to the education of foreign students.

(ii) Even if one assumes that a human-capital approach is justified in estimating these benefits, it is not quite obvious whether the value of embodied capital should be evaluated as the cost of producing equivalent capital in the U.S.A. or of producing it in the country of emigration, since the latter is much smaller than the former.[26] This is specially because the majority of the non-returnees comes from the Third World countries, where educational expenditures are very small compared to those of the U.S. and earnings foregone are even smaller. If one uses the data of the countries of emigration the benefits will be much smaller.

(iii) There are several assumptions implicit in these estimations, and the results are quite sensitive to these assumptions. Since the data on the number of students whose status was adjusted as immigrants in 1982 was not available, a linear regression was used to obtain an estimate. The implicit assumption is that the same trend continued beyond 1979. Moreover, the assumption that 20 percent of the immigrants woth occupational preference are "return students" is arbituary. Still another assumption in our counterfactual model is that there is no quality differential between human-capital produced in the U.S. and elsewhere at the undergraduate level. Finally, the calculations of the earnings foregone are based on the assumption that every American citizen who would have been educated instead of importing an immigrant, would have otherwise been continuously employed full-time from the age if 14 years to the age of 23 years. Any deviation from the above assumption will reduce the benefits.

In interpreting these results one should also bear in mind that not all of economic costs and benefits have been included in these calculations, not to mention the non-economic costs and benefits. Some of the obvious omissions are:

(i) The user cost of capital, which consist of the rent foregone and depreciation of land and buildings, has not been included.

(ii) Expenditures on research have been excluded from E & G expenditures. Most of the writers exclude research expenditures from educational expenditures in the cost-benefit calculus of education irrespective of whether the study pertains to all students or exclusively foreign students,[27] the argument being that the research could be done elsewhere and therefore does not directly contribute to the teaching. This argument is not fully justifiable in case if foreign students. While instructional expenditures are the cost of transmission of knowledge, research expenditures are the cost of creation of knowledge. The sending countries benefit from the latest research embodied in the return students, and therefore part of the research expenditure should have been included in the cost estimates.

(iii) Subsidy involved in educating the spouses and children of foreign students.

(iv) The losses due to any return migration.

(v) Remittances which the non-returnees send to their home countries.

(vi) The benefits to the U.S. students abroad.

(vii) Export stimulus generated by the ex-students' preference for American goods and their familiarity with American technology.

Most of these omissions are forced because of the lack of appropriate data.

Moreover, these results do not imply that the countries which send their

students to the U.S. are the net losers. None of these costs and benefits have been calculated from the point of view of the sending countries, which could be quite difficult. For instance the actual production cost of the exported human-capital to the sending countries may be less than 1/20th of the cost of producing its equivalent in the U.S.

Finally, these calculations, despite all data problems, do not lead to the conclusion that the U.S. should have a serious concern about the foreign students. Even if the benefit from the non-returnees are excluded, the subsidy is only 280 million dollars. In view of the international obligations and other benefits of such programs, they should be promoted further.

NOTES

[1]Foreign Students and Institutional Policy: Toward an Agenda for Action. A report of the Committee on Foreign Students and Institutional Policy. American Council on Education, 1982.

[2]For a review of such policies see Williams, P., (ED) The Overseas Student Question: Studies for a Policy. Overseas Student Trust. London, 1981.

[3]U.S. foreign missions do scrutinize prospective foreign students in terms of visa, language and financial requirements, and whether appropriate facilities for such a course are available locally. The intent, however, is not to regulate the volume of flow but to screen out those applicants who either have motives other than education or who are liable to run into serious problems.

[4]ACE report p. 17.

[5]The only study of which the author is aware is by Grubel and Scott, in which they have used 1954/55-63/64 data. Since then there have been significant changes in many respects, and it certainly deserves a fresh look. Groubel, H.G. and Scott, A.D., "The Cost of U.S. College Student Exchange Programs". J. of Human Resources, Vol. 1, No. 2, Fall 1966.

[6]The long run in his study refers to the inflexibility of the faculty rather than the size of the school. Blaugh, M., "The Economic Costs and Benefits of Overseas Students", The Overseas Student Question, 1981.

[7]As it does when an education administrator argues that in the short run almost all educational costs are fixed, and hence, marginal cost is near zero. Therefore it will only add to the benefits by recruiting more nontraditional students including foreign students.

[8]Blaugh has used long-run marginal cost as 2/3 of the long-run average cost.

[9]Open Doors 1979/80. Report on International Educational Exchange. Institution of International Education.

[10]Costs by department and by level have been estimated by McCarthy and Garrison. However their data pertains to 1973/74 and only for five departments. McCarthy and Garrison, W.D., The Costs and Benefits of Graduate Education: Estimation of Graduate Degree Program Costs. The council of Graduate Schools in the United States, 1978.

[11]In E & G expenditure I did not include expenditures corresponding to research and public services.

[12]This estimate is based on the assumption that the ratio of E & G expenditure per student (all levels) in private and public schools is the same as the corresponding ratio at the G.S. level. The former ratio is calculated from the ULSL average E & G expenditure per student (exclusive of research and public services) as given in Higher Education Financing in the Fifty States. Interstate Comparisons, Fiscal year 1976. The National Institute of Education.

[13] Open Doors, 1979/80.

[14] National Science Foundation Academic Supplement, 1979.

[15] Open Doors 1978/79.

[16] Geographic distribution within world regions is available in Open Doors.

[17] These calculations are based on the assumption that the average stay of US sponsored students is one year. The economy fares are taken from Official Airline Guide.

[18] Wiprud H.R. (compiled) International Education Programs of the US Government. An Inventory. International Education Task Force. Federal Interagency Committee on Education, US Department of Education, 1978.

[19] This basically is the procedure followed by Blaugh in his 1981 study.

[20] Grubel, H; Scott, A. The international Flow of Human capital. American Economic Review, May 1966. Parai, L, Immigration and Emigration of Professional and skilled Manpower During the Post-War Period, special study no 1, Economic Council of Canada, 1965.

[21] Schultz, T.W. "Capital Formation by Education", Journal of Political Economy, 68, Dec. 1960.

[22] Johnson, H.E., "Some Economic Aspects of the Brain Drain", Pakistan Development Review, Autumn 1967.

[23] The data on educational expenditures is taken from The Condition of Education and The digest of Education Statistics. National Center for Educational Statistical. The data on interest rate and consumer price index is taken from U.S. Statistical Abstracts.

[24] The data on earnings is taken from Current Population Reports U.S. Bureau of the Census. Various issues.

[25] The latest data available on immigration is for 1980. The figure 28, 138 is an estimated number of non-returnees in 1982, on the assumption that those foreign students who do not return become immigrants after three years. This estimate was obtained as follows: First I estimated the number of students whose status was adjusted as immigrants. This was done by using linear regression. The second component, i.e., the "return students" as immigrants with occupational preference was obtained as 20 percent of the average number immigrants with occupational preference in the last three years. The reason I used an average rather than a regression is that All data was taken from ISN Annual Report: Immigration and Naturalization Service. Various issues.

[26] For a critical review whether human-capital approach should be used see, Scott, A., "The Brain Drain - Is a Human -Capital Approach Justified?", in Lee, W.; (ed) Education, Income and Human Capital: Studies in Income and Wealth, NBER, no. 35, 1968.

[27] Some writers exclude research expenditures from restricted funds, others all research expenditures.

DATA

The data used in this study are obtained from the National Longitudinal Study of Young Men 14-24 in 1966. The following variables were constructed for each individual between 17 and 24 years of age. There are 3,172 usable observations.

COLLEGE--a binary variable = 1 if respondent was attending college, = 0 otherwise.
AGE--respondent's age in years (17-24).
RACE--a binary variable = 1 if respondent was white, = 0 otherwise.
MARITAL--a binary variable = 1 if respondent was married with spouse present, = 0 otherwise.
DEPENDENTS--the number of respondent's dependents excluding wife.
URBAN--a binary variable = 1 if type of property of respondent's residence was urban, = 0 otherwise.
UNEMPR--the unemployment rate for the labor market of respondent's current residence.
VETERAN--a binary variable = 1 if respondent had served in the Armed Forces, = 0 otherwise.
HSCURR--a binary variable = 1 if respondent's high school curriculum was college preparatory or general, = 0 otherwise.
FATHLV--a binary variable = 1 if the respondent's father is living, = 0 otherwise.
MOTHLV--a binary variable = 1 if the respondent's mother is living, = 0 otherwise.
FATHED--a binary variable = 1 if the respondent's father attended college, = 0 otherwise.

VARIABLE	COEFFICIENT	DERIVATIVE
INTERCEPT	-11.15 (14.54)	.04517
AGE	.3044 (11.24)	.1901
RACE	1.281 (8.11)	-.1711
MARITAL	-1.153 (6.49)	-.1642
DEPENDENTS	-1.107 (6.06)	.06646
URBAN	.4478 (3.78)	-.002675
UNEMPR	-.01802 (0.56)	-.3015
VETERAN	-2.031 (9.38)	.2745
HSCURR	1.850 (8.96)	.05280
FATHLV	.3557 (1.90)	.1369
MOTHLV	.9228 (2.31)	.1090
FATHED	.7348 (2.96)	

TABLE I

	(1)	(2)	(3)	(4)	(5)
Subject Classes by level	Weights	No. of Foreign Students in 4 yr. Public Institutions	No. of Foreign Students in 4 yr. Private Institutions	No. of U.S Equivalent Foreign Students in 4-yr Institutions: Public	No. of U.S Equivalent Foreign Students in 4-yr Institutions: Private
General Studies	1.00	30,878	19,610	30,878	19,610
General Studies III	1.497	15,416	5,759	23,708	8,621
Baccalaureate I	1.420	30,981	20,429	43,993	29,009
Baccalaureate II	1.887	4,442	2,157	8,382	4,070
Baccalaureate III	2.365	20,803	8,226	49,199	19,455
Masters/Professional I	2.067	18,633	11,905	38,514	24,608
Masters/Professional II	3.332	2,667	2,139	8,886	7,127
Masters/Professional III	5.275	17,357	7,138	91,558	37,653
Doctoral I	3.108	6,398	4,219	19,885	13,113
Doctoral II	5.974	5,214	2,144	31,148	12,808
Total		152,789	83,726	345,521	176,074
No. of G.S. equivalent students in 2-yr. schools				32,186	17,637
Total no. of G.S. equivalent foreign students				377,707	193,711

Source: Column is obtained by adjusting the weighting system of Ohio Board of Regent's financial model for fiscal year 1980 to the U.S. level and condensing the first two categories of the original Regent's subject classification into one. Columns (2) and (3) are estimated on the assumption that the distribution of foreign students by field of study in four-year private schools is the same as in four-year public schools and that within each field of study the distribution by academic level is the same. The data source is Open Doors, 1979/80.

TABLE 2

Institutions	FTE Foreign Students Converted to GS Level	E & G per GS equivalent Student	Total E & G Expenditure (Thousands dollars)
Four-year Public	329,904	2,537	836,966
Four-year Private	171,707	3,760	645,618
Two-year Public	29,817	1,994	59,455
Two-year Private	16,339	2,955	48,282
Total			1,590,321

TABLE 3

Institutions	(1) No. of non-U.S. Supported Foreign Students	(2) Average Out-of-state Tuition-1979/80	(3) Total Revs. (Thousands dollars)
Two-year Public	31,551	1,294	40,827
Two-year Private	16,478	2,069	34,093
Four-year Public	144,288	1,983	286,123
Four-year Private	75,225	3,357	252,530
Total			613,573

Source: For Column (1) see text. Column (2) is obtained from Digest of Education Statistics, 1981. Figures corresponding to four-year schools are average of universities and other four-year schools.

TABLE 4

E & G EXPANEITURES 1956/66 - 1981/82

Year	E & G Expd. per Student (constant 79/80 dollars)
1965/66	1590
1966/67	1692
1967/68	1794
1968/69	1879
1969/70	1963
1970/71	2046
1971/72	2128
1972/73	2199
1973/74	2270
1974/75	2323
1975/76	2375
1976/77	2428
1977/78	3377
1978/79	3646
1979/80	4433
1980/81	4632
1981/82	4841

Source: Data for the years 1965/66 - 1979/80 are taken from Digest of Education Statistics, various issues. For the years 1980/81 and 1981/82 the E & G expenditures for 1979/80 are inflated by the Higher Education price index corrected for inflation. Higher Education price index was taken from The U.S. Statistical Abstracts.

TABLE 5

AVERAGE EARNINGS

Year	Average Earnings (constant 1979/80 dollars)
1974	7286
1975	6179
1976	7258
1977	8903
1978	10696
1979	10979
1980	12772
1981	16372
1982	18264

Source: Data for 1974 - 1980 is taken from Current Population Reports, U.S. Bureau of the Census. For 1981, average starting salary offers for Bachelors and Masters are taken from U.S. Statistical Abstracts. For 1982 it was extrapolated. All figures adjusted to constant 1979/80 dollars.